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See image for Certificate of Correction

TITLE: Color image processing
apparatus for extracting image
data having predetermined
color information from among
inputted image data and for
correcting inputted image
data in response to the
extracted image data

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PARENT-CASE:

This application is a continuation of
application Ser. No. 07/030,618 filed
Mar. 27, 1987 now abandoned. BACKGROUND OF THE
INVENTION

1. Field of the Invention

The present invention relates to a color image
processing apparatus and
particularly to such an apparatus performing color
correction.

2. Related Background Art

Color correction of an image has been adopted in the field of printing or the like. For instance, if the skin color of a human is reproduced with a light green tinge, it is necessary to correct it to a more desirable skin color. However, whether the correction is to be carried out or the amount of correction has been mostly dependent upon experience and intuition. Such a problem arises not only with respect to the color of skin but also with respect to color of sky and the like.

SUMMARY OF THE INVENTION

The present invention has been made in view of the above problem. It is therefore an object of the present invention to provide a color image processing apparatus capable of performing an optimum color correction.

According to an aspect of the present invention, it is checked if a predetermined color is included in an original image and if the color exceeds in quantity a certain value. If the original includes such a color exceeding a certain value, a correction quantity is determined to perform color correction of the original.

According to another aspect of the present invention, a skin color, which is a most distinguishing color among colors of an original, is made an object of processing. If a skin color exceeding in quantity

a certain value is included in an original, a correction quantity is determined to automatically perform color correction of the tone of an overall original image, with emphasis upon a skin color.

The above and other objects of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings.

COUNTRY	FOREIGN-APPL-PRIORITY-DATA:	
APPL-DATE	APPL-NO	
JP	61-071345	March
31, 1986		
JP	61-123701	May 30,
1986		

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Parent Case Text - PCTX (9):

According to another aspect of the present invention, a skin color, which is a most distinguishing color among colors of an original, is made an object of processing. If a skin color exceeding in quantity a certain value is included in an original, a correction quantity is determined to automatically perform color correction of the tone of an overall original image, with emphasis upon a skin color.

Detailed Description Text - DETX (3):

The color image processing apparatus of FIG. 1 is provided with an Luv conversion unit 1, a first skin color count unit 2, a second skin color count unit 3, a pixel number discrimination unit 4, a maximum value discrimination unit 5, a correction quantity operation unit 6, a color correction unit 7, an RGB conversion unit 8, and a signal line 10. The color image processing apparatus of FIG. 4 is provided with a CPU 40, a RAM 42, a ROM 41, an image data input unit 43, and a color correction data output unit 44.

Detailed Description Text - DETX (6):

The brief description of the first embodiment has been given as above. The following is a detailed description therefor. FIG. 1 is a block diagram showing the first embodiment image processing apparatus. An image is assumed to be composed of RGB values. The circuit portion of FIG. 1 including the units 1 to extracts a skin color from an image and obtains a correction quantity, while the circuit portion including the units 7 and 8 performs color correction in accordance with the obtained correction quantity. First, the description will be directed to a procedure for extracting a skin color and obtaining a correction quantity.

Detailed Description Text - DETX (16):

First, RGB values are obtained from an original image using an unrepresented image input device. In this case, all of the

pixels of the original are not needed in judging if color correction is to be performed, but the center portion (e.g. region 50 of FIG. 7) of the original omitting its periphery can suffice even on the condition that every second or third pixel within the center portion be used. One of the reasons for this is that in the color image processing apparatus whose object is reproducing a skin color since a skin color such as that of a human face is located at the middle of an original in most cases, as shown in FIG. 7, it is possible to use as its object region only the region 50 including a skin color in judging if color correction is to be performed. Another reason is that since a skin color changes abruptly, every second or third pixel may suffice. On the contrary, if an object to be corrected is not located at the center of an original, it is then necessary to use as a judgment region the entire image or the portion upon which an object color concentrates.

Detailed Description Text - DETX (29):

The determined correction quantity together with the weight as explained in FIGS. 10A and 10B is used for color correction to obtain a natural skin color. As compared with the method using a fixed reference skin color shown in FIG. 8 wherein a correction quantity will become excessive in a certain input image, the correction quantity most suitable for the skin color of an input image can be calculated with the method of FIG. 11, and in

addition, there is no case where the correction quantity becomes too large.

Detailed Description Text - DETX (32):

As seen from the above description of the embodiments, by shifting a pixel location where pixels having a skin color of an image exist at a maximum to another pixel location of a skin color having a proper tone, it is possible to automatically perform color correction of a skin color to a proper skin color.

Further, by incorporating the region outside the skin color region as an object region to be corrected, a smooth color correction can be achieved.

Detailed Description Text - DETX (33):

As an object color to be corrected in the color image processing apparatus, a skin color

has been used since it is most sensitive and perceptible to humans and needs to be color-corrected. If color reproduction with high fidelity is desired, any desired color may be used as an object to be corrected.

Current US Cross Reference Classification - CCXR
(2):

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